REMARKS

Claim 24 is the sole claim presented for consideration.

Editorial changes to the specification will be made in due course. In addition, a new abstract is submitted to better set forth the technical features of Applicant's claimed invention.

Claims 16-23 have been cancelled and replaced with Claim 24. It is submitted that Claim 24 is consonant with the invention of Claims 16-23.

Initially, the claim objections and rejections under 35 U.S.C. §112, second paragraph, are deemed to be moot in view of the cancellation of Claims 16 and 23.

Claims 16-23 were rejected under 35 U.S.C. §103 as allegedly being obvious over Merrill '253 in view of Drowley '081. Without conceding the propriety of this rejection, Claims 16-23 have been cancelled. This rejection is therefore deemed to be moot and should be withdrawn.

It is further submitted that Applicant's invention as set forth in Claim 24 is allowable.

Claim 24 relates to a method of manufacturing a MOS-type solid-state image pickup device comprised of a photoelectric conversion unit having a first semiconductor region of a first conductivity type, a second semiconductor region of a second conductivity type forming a pn-junction between the first and second semiconductor regions, and a third semiconductor region of the first conductivity type disposed in contact with the second conductor region at a light incident side of the second semiconductor region, a transfer MOS transistor having a fourth semiconductor region of the second conductivity type disposed in contact with the first

semiconductor region, and a gate electrode disposed on an insulating film on the first semiconductor region between the photoelectric conversion unit and the fourth semiconductor region to transfer a charge carrier from the second semiconductor region to the fourth semiconductor region, a fifth semiconductor region of the second conductivity type arranged continuously to the second semiconductor region under the gate electrode, and a semiconductor substrate of the second conductivity type on which the photoelectric conversion unit and the transfer MOS transistor are disposed. The method includes a first step of forming the second semiconductor region by ion implanting an impurity of the second conductivity type at a first angle with a first energy using the gate electrode as a mask, and a second step of forming the fifth semiconductor region by ion implanting an impurity of the second conductivity type at a second angle with a second energy using the gate electrode as a mask. In addition, a third step forms the fourth semiconductor region by ion implanting an impurity of the second conductivity type. As claimed, the second energy is smaller than the first energy, with the first and second angles being angles to a direction normal to a surface of the semiconductor substrate, the second angle larger than the first angle, and the first and third steps being performed separately.

Support for Claim 24 can be found, for example, on page 9, line 8, *et. seq.*, of the specification. In accordance with Applicant's claimed invention, a high performance method of manufacturing a MOS-type solid-state image pickup device is provided.

The primary citation to Merrill relates to a solid state image pickup device and is said to include a photoelectric conversion unit, first and second semiconductor regions and a third semiconductor region disposed at a light incident side of the second semiconductor region.

In addition, a charge transfer unit transfers a signal charge, and a fourth semiconductor region within the first semiconductor region receives a transfer photo signal charge.

The secondary citation to Drowley relates to a semiconductor image sensor and was cited for its teaching of a second semiconductor region formed by a plurality of ion implantations.

It is respectfully submitted, however, that the patents to Merrill and Drowley, whether taken individually or in combination with each other, fail to teach or suggest a manufacturing method that includes forming five semiconductor regions in the manner set forth in Applicants' claimed invention.

Accordingly, it is submitted that Claim 24 is patentable.

In view of the foregoing, reconsideration and allowance of this application is deemed to be in order and such action is respectfully requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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